

OCZ SSDs and Energy Efficiency

Improved performance and power savings through the benefits of innovative solid state storage solutions

White Paper: Green Computing

The Issue:

Enterprise storage has previously relied on traditional hard drives which exhibit performance limitations that require system architects to create huge arrays that consume vast amounts of power and are costly to maintain. As annual energy costs continue to rise into the billions of dollars per year, energy efficiency is becoming a major focus for large scale businesses and OCZ Technology is exploring technologies and solutions to improve the performance, reliability, and total cost

of ownership for enterprise computing applications. Datacenters are seeking a solution that surpasses the current limitations of hard drives and are both easier and less expensive to maintain.

Energy Consumption for data centers (per 500 watts)

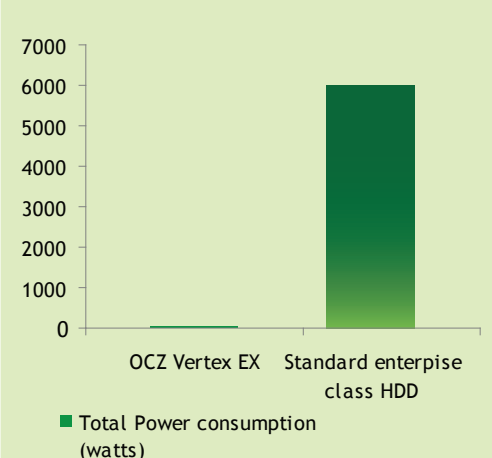
AC/DC losses	146
Processors	96
Drives	80
PCI Cards	46
DC/DC	36
Chipset	36
Fans	36
Memory	30

A Closer Look:

As the demand for information access has increased exponentially over the past decade to meet the growth of the Internet as whole, including e-commerce and commercial databases, the demand placed on datacenters has intensified. These datacenters have evolved to become both larger and increasingly power-hungry, with most datacenters requiring performance in excess of 100K IOPS (Input/Output Operations Per Second). The resulting energy expense according to the world's leading information technology research company, Gartner, has been predicted to grow to become the 2nd largest energy related expense in the United States.

Hard drive technology has progressed at a significantly slower rate than CPU processing, and while traditional hard drive manufacturers have increased the capacity of drives the basic performance in terms of access speed and power consumption has not changed in over a decade, to compensate for this IT professionals have been forced to create SANs (Storage Area Networks) by connecting hundreds of traditional hard drives in parallel in an effort to improve performance, but at the expense of the power requirements necessary to maintain such an immense configuration.

Total Power Consumption in watts per 100k IOPS

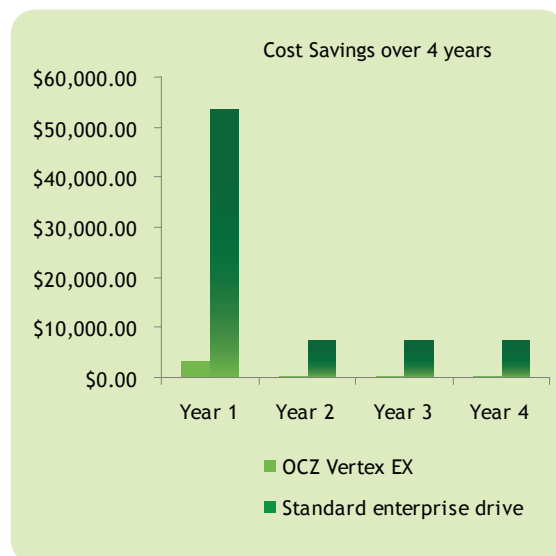


OCZ SSDs offer a more efficient path:

OCZ is able to address the challenge of improving performance while reducing energy consumption by drawing on the company's expertise in flash memory. By adapting the technology in the company's existing flash storage devices, OCZ has been able to introduce refined SSD (solid state drive) solutions for enterprise level computing. The flash memory utilized within these drives is faster and utilizes less power than conventional hard drives, is able to store data even when the device is not powered, and is more reliable.

OCZ's SSDs use significantly less power than a hard disk of the same capacity because there is no need to drive physical moving parts within the drives; hard drives on the other hand may continually rotate even when not being utilized, and OCZ's SSDs are able to more quickly and efficiently access data electronically versus mechanically. Because these SSDs offer such rapid access times they also eliminate the need for a large costly storage area network, and without the massive array there are colossal power savings.

A secondary benefit is savings in maintenance costs due to the fact that employing many less hard drives will require a smaller facility to house the same operation. In addition, the overall heat generated by the system is significantly reduced, allowing the associated costs to be slashed.



Energy comparison between OCZ Vertex EX SSD and a Standard Enterprise Drive

	Energy consumption	Drives Needed for 100k IOPS	Total Power consumption (watts)	Infrastrucure	Annual energy costs	Annual Cooling costs
OCZ Vertex EX	2	2	40	\$3,500	\$30.00	\$175.00
Standard enterprise class HDD	20	300	6000	\$49,500.00	\$4,000.00	\$3,500.00
Savings				\$46,000.00	\$3,970.00	\$3,325.00

Cost savings over a 4 year period	Year 1	Year 2	Year 3	Year 4	Total
OCZ Vertex EX	\$3,530.00	\$205.00	\$205.00	\$205.00	\$4,145.00
Standard enterprise drive	\$53,500.00	\$7,500.00	\$7,500.00	\$7,500.00	\$76,000.00
Savings	\$49,970.00	\$7,295.00	\$7,295.00	\$7,295.00	\$71,855.00

The Bottom Line:

OCZ Solid State Drives offer increased performance, lower overall power consumption, and decreased heat output, allowing companies to slash energy, cooling, maintenance, and hardware costs. The larger the datacenter the greater the savings benefits that can be realized by utilizing OCZ's more energy efficient enterprise SSD solutions.